

## PROJECT SUMMARY

|                |   |                 |                         |
|----------------|---|-----------------|-------------------------|
| <b>DATE</b>    | January 2001  | <b>LOCATION</b> | Chateau Thierry, France |
| <b>SUBJECT</b> | RETROFIT OF CONTROL SYSTEMS FOR EAS1 MOBILE GENERATOR |                 |                         |

### Overview

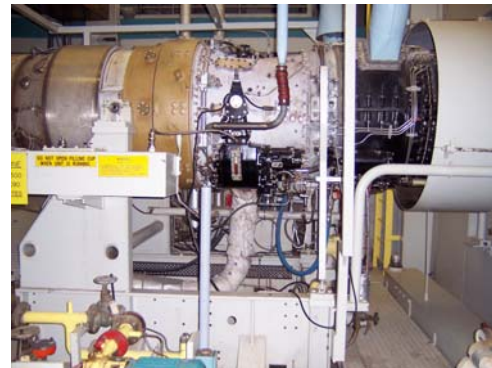
Due to a shortfall of electrical power in France during 2001, EDF bought two gas turbine mobile generating sets from Wood Group in Aberdeen. These were installed at Chateau Thierry in France and used to provide power to the grid system during periods of peak demand.

### The Problem

The key requirements of an emergency power generator is to start at short notice, reach full load in a short time and run reliably for the peak demand period.

The existing fuel control system fitted to the EAS1 mobile gas turbine consists of:-

- Analogue electronic governor interfacing with an on-engine hydro-mechanical fuel control unit.
- Relay based sequence control system.



The on-engine fuel control components are seen as major source of system unreliability. This equipment is built to aerospace standards and is very susceptible to the aggressive environment of an industrial application, particularly in terms of fuel quality. Hydro-mechanical equipment is also notoriously difficult to maintain and troubleshoot and being of an aero-space standard it is also very expensive to repair.

The analogue electronic governor and relay based sequencer were also prone to frequent breakdown. The system is has very limited diagnostics which has the effect of extending the fault finding process. The problems with the control system meant that the requirements of a fast start at short notice could rarely be achieved.

Wood Group employed TCL to supply a replacement control system because of their past experience with the RR Avon and their ability to supply a tried and tested off-engine fuel system.

### The Solution

Replace the gas turbine control system with modern state of the art equipment that is more suited to the requirements of an industrial application.

The heart of the new control system is the Posiflow off engine liquid fuel which has been installed on numerous similar installations. This system uses a positive displacement gear pump driven at a variable speed by an electric motor and frequency converter. The gear pump is very rugged and ideally suited to an aggressive industrial environment.

The following equipment was removed:-

- Analogue electronic Governor





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- Relay based Sequencer and trip system
- On-engine fuel control system

The following equipment was installed:-

- Allen Bradley ControlLogix PLC based governor and unit Sequencer
- Rockwell RSView32 HMI and SCADA system
- Hard Wired Trip system

The equipment had to be compatible with retained equipment and adhere to the overall control system philosophy devised by Rolls-Royce and GEC.

Following successful installation and commissioning of the equipment the gas turbine start and operating reliability has significantly improved. The improved diagnostics of the SCADA based HMI allow rapid fault finding and early indication of required maintenance.